

# PFAS, Ecology, and the PFAS Chemical Action Plan

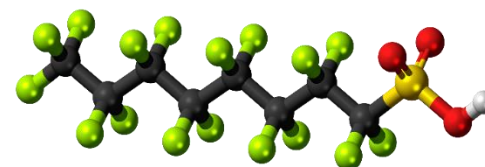
Snohomish Implementation Committee Meeting

Kara J. Steward  
Hazardous Waste and Toxics Reduction Program  
May 29, 2019

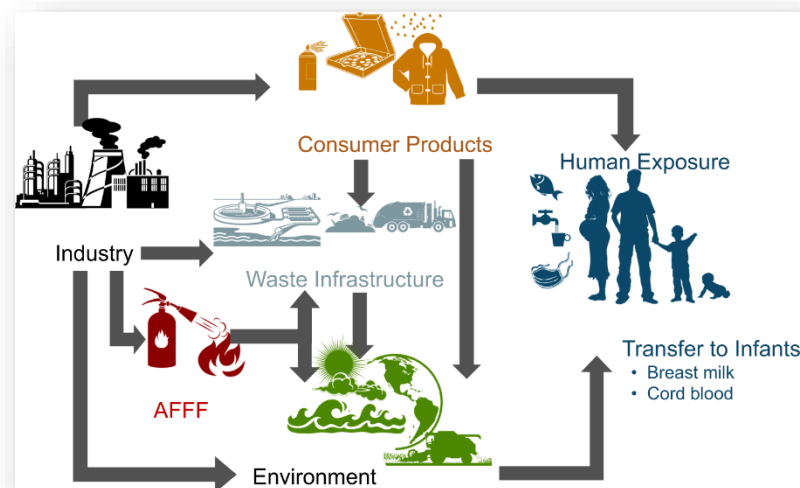


# Per- and Polyfluorinated Alkyl Substances

- 4,700 chemicals in the class
  - Repel oil and water
  - Resist high temperature
  - Reduce friction
- Concerns
  - Persistent
  - Toxic
  - Bioaccumulative
  - Mobile



PFOS molecule  
 $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\text{H}$



# PFAS-Containing Products



Electronics: High frequency signal transmission; smudge-resistant touch screens



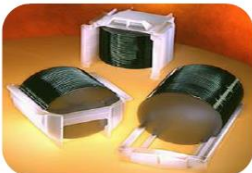
Membranes in outdoor apparel, providing a breathable barrier against wind and rain



Medical Devices: High dielectric insulators in medical equipment that relies on high frequency signals



Aerospace/Auto: Weight reducing fuel lines; heat/chemical resistant wire coatings



Semiconductor manufacturing: Providing pure environments to transport/store harsh chemicals



Nonstick surfaces in cookware and small appliances



Healthcare: Garments/Drapes that Protect Against Disease Transmission



First Responder Gear Treatments and Bulletproof Vests that Maintain Performance in Extreme Conditions



Oil/Grease Resistant Food Packaging that is Recyclable, Increases Shelf-Life, Reduces Packaging



Textiles/Carpet with Water/Oil Repellency, Stain Resistance and Soil Release and Longer Useful Life



Class B (Flammable Liquid) Fire Fighting Foam with Shorter Extinguishing Time and Burnback Resistance



**FluoroCouncil**  
Global Industry Council  
for FluoroTechnology

<https://fluorocouncil.com/fluorocouncil/about/>



# PFAS Fact Sheets



Search this website

Navigating this Website

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## PFAS – Per- and Polyfluoroalkyl Substances

HOME

# Welcome

### Technical Resources for Addressing Environmental Releases of Per- and Polyfluoroalkyl Substances (PFAS)

This Interstate Technology and Regulatory Council (ITRC) online document includes fact sheets for the ITRC team. The team is currently working on the associated Technical and Regulatory Guidance.

ITRC has developed a series of [fact sheets](#) to summarize the latest science and emerging polyfluoroalkyl substances (PFAS). The fact sheets are tailored to the needs of state regulators tasked with making informed and timely decisions regarding PFAS-impacted sites. The core parties responsible for the release of these contaminants, as well as public and tribal stakeholders, are:

1. Naming Conventions and Physical and Chemical Properties
2. Regulations, Guidance, and Advisories
3. History and Use
4. Environmental Fate and Transport
5. Site Characterization Considerations, Sampling Precautions, and Laboratory Analytical Methods
6. Remediation Technologies and Methods
7. Aqueous Film Forming Foam

### History and Use of Per- and Polyfluoroalkyl Substances (PFAS)

#### 1 Introduction

The unique physical and chemical properties of per- and polyfluoroalkyl substances (PFAS) impart oil and water repellency, temperature resistance, and friction reduction to a wide range of products used by consumers and industry. For example, PFAS, have been used in coatings for textiles, paper products, and cookware and to formulate some firefighting foams, and have a range of applications in the aerospace, photographic imaging, semiconductor, automotive, construction, electronics, and aviation industries (KEMI 2015; USEPA 2017b). USEPA has compiled a web-based resource for PFAS information. The information includes topics such as Policy and Guidance, Chemistry and Behavior, Occurrence, Toxicology, Site Characterization and Remediation Technologies (USEPA 2017h).

The scientific community is rapidly recognizing and evolving its understanding of the environmental and health impacts associated with the release of PFAS. Certain PFAS, most notably some of the perfluoroalkyl acids (PFAAs), such as perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS), are mobile, persistent, and bioaccumulative, and are not known to degrade in the environment (USEPA 2003b; ATSDR 2015; NTP 2016; Concawe 2016).

Understanding the manufacturing history of PFAS, as well as past and current uses, allows for the identification of potential environmental sources of PFAS, possible release mechanisms, and associated pathway-receptor relationships.

#### 2 Discovery and Manufacturing History

PFAS are a complex family of more than 3,000 manmade fluorinated organic chemicals (Wang et al. 2017) that have been produced since the mid-20th century, although not all of these may be currently in use or production. Table 2-1 provides a general timeline of initial synthesis and commercial production of some of the more well-known PFAS, along with some of the more frequently associated products.

PFAS are produced using several different processes. Two major processes have been used to manufacture fluorosurfactants (includes PFAAs) and side-chain fluorinated polymers: electrochemical fluorination (ECF) and telomerization (KEMI 2015). ECF was licensed by 3M in the 1940s (Banks, Smart, and Tatlow 1994), and used by 3M until 2001. ECF produces a mixture of even- and odd- numbered carbon chain lengths of approximately 70% linear and 30% branched substances (Concawe 2016). Telomerization was developed in the 1970s (Benskin 2011), and yields mainly even numbered, straight carbon chain isomers (Kissa 2001; Parsons et al. 2008).

ITRC has developed a series of six fact sheets to summarize the latest science and emerging technologies regarding PFAS. The purpose of this fact sheet is to:

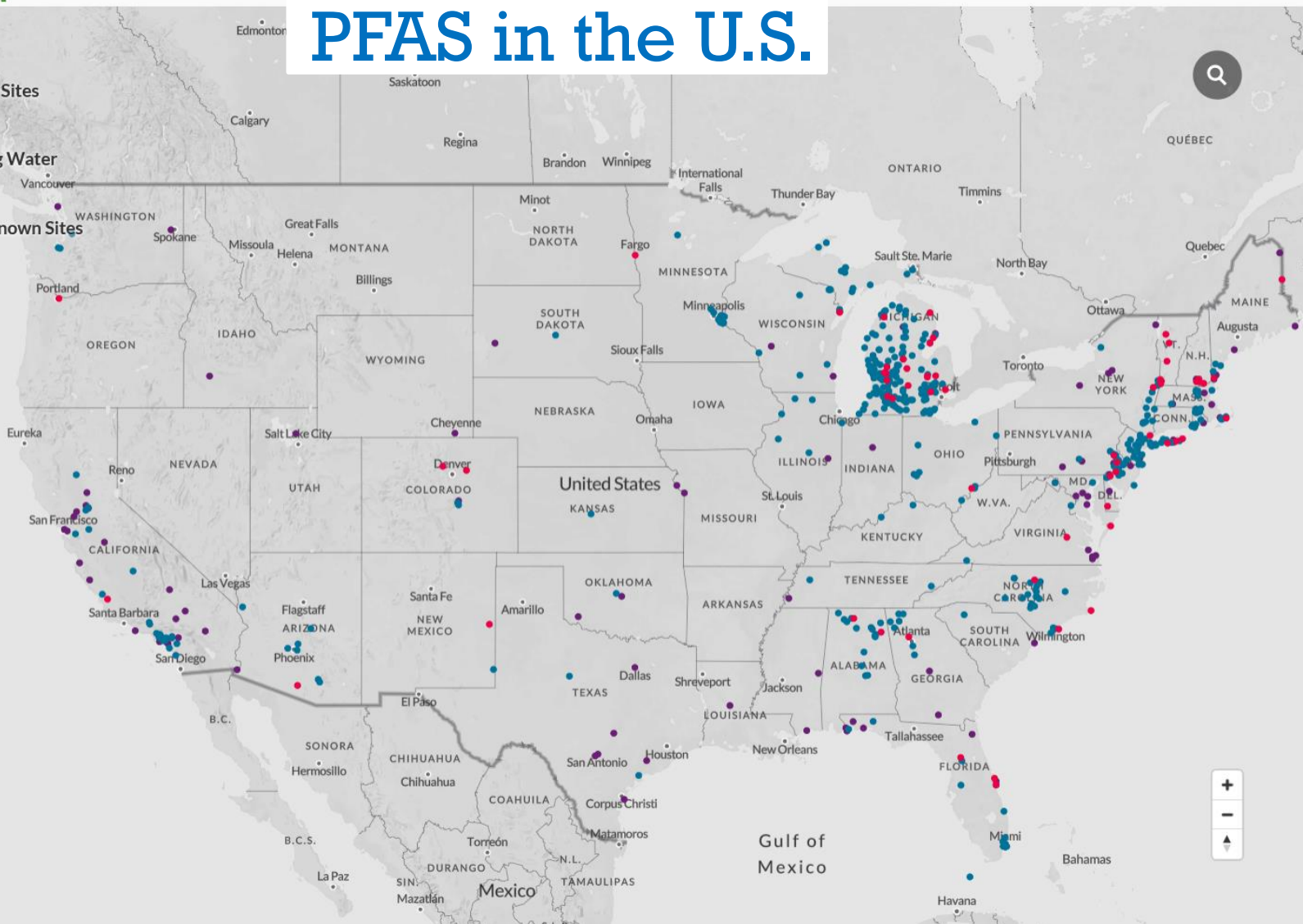
- provide an overview of the discovery and development of PFAS and the subsequent detection of PFAS in the environment
- describe emerging concerns of potential adverse human health effects, and efforts to reduce use or replace with alternate formulations, or both
- identify the major sources of PFAS in the environment, as well as other sources of PFAS to the environment that may be of interest





# PFAS in the U.S.

- ☒ Military Sites
- ☒ Drinking Water
- ☒ Other Known Sites



# PFAS in the news



## Fairchild partners with Airway Heights to provide water to residents affected by water advisory

92nd Air Refueling Wing Public Affairs / Published May 18, 2017



## JBLM Wells Shut After Unacceptable Levels of Chemicals Found in Water



The News Tribune | 3 Mar 2017 | by Adam Lynn

SPOKANE

## Neighbors of Fairchild Air Force Base sue makers of toxic fire retardant, including 3M Co.

UPDATED: Wed, April 17, 2016, 9:23 a.m.



Julie Giblin, whose family has lived near Fairchild Air Force Base since the 1960s, is one of many residents concerned about water contamination from the base's firefighting operations. She posed for a photograph beside the groundwater pump that supplies her homestead on Thorpe Road on Nov. 16, 2017. (Cody Munking / The Spokesman-Review)



Environment | Local News | Nation & World Politics | Northwest

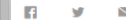
## Washington state to test drinking water for PFAS contamination linked to firefighting foam

Originally published May 21, 2018 at 6:00 am | Updated May 21, 2018 at 12:10 am




The Navy drilled monitoring wells around a Whidbey Island airstrip after detecting traces of chemicals used in aviation firefighting foams. (Hal Berenson/The Seattle Times)

## The Teflon Toxin



In this series, [Sharon Lerner](#) exposes DuPont's multi-decade cover-up of the severe harms to health associated with a chemical known as PFOA, or C8, and associated compounds such as PFOS and GenX. [Read](#) our complete coverage of PFAS pollution.

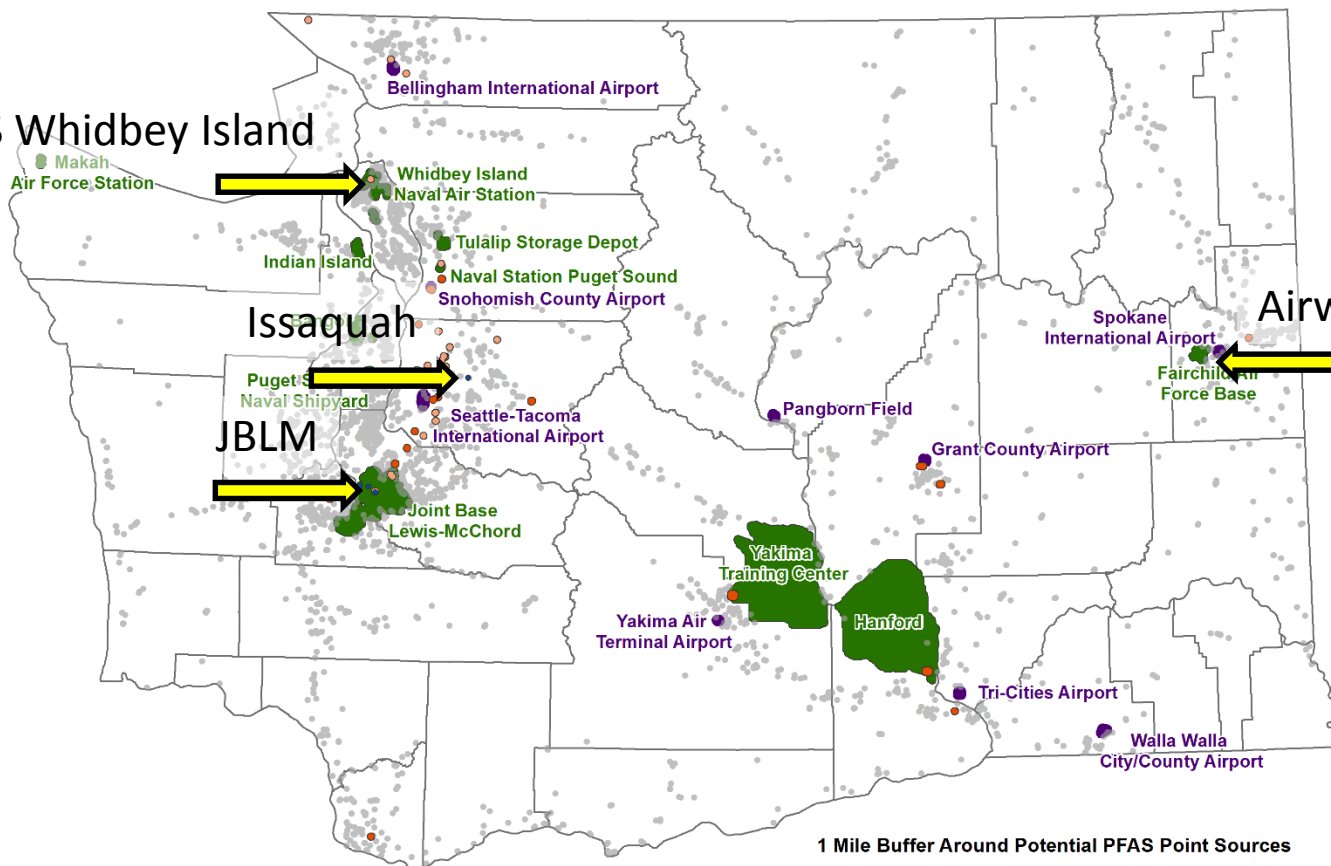
-  **PART 1**  
**How DuPont Slipped Past the EPA**
-  **PART 2**  
**The Case Against DuPont**
-  **PART 3**  
**DuPont and the Chemistry of Deception**



<https://theintercept.com/collections/bad-chemistry/>

# PFAS in WA

NAS Whidbey Island



Airway Heights

1 Mile Buffer Around Potential PFAS Point Sources

- Water Sources
- AFFF Certified Airports
- Fire Training Center
- Military Land
- DOE Spill Site
- UCMR Detection

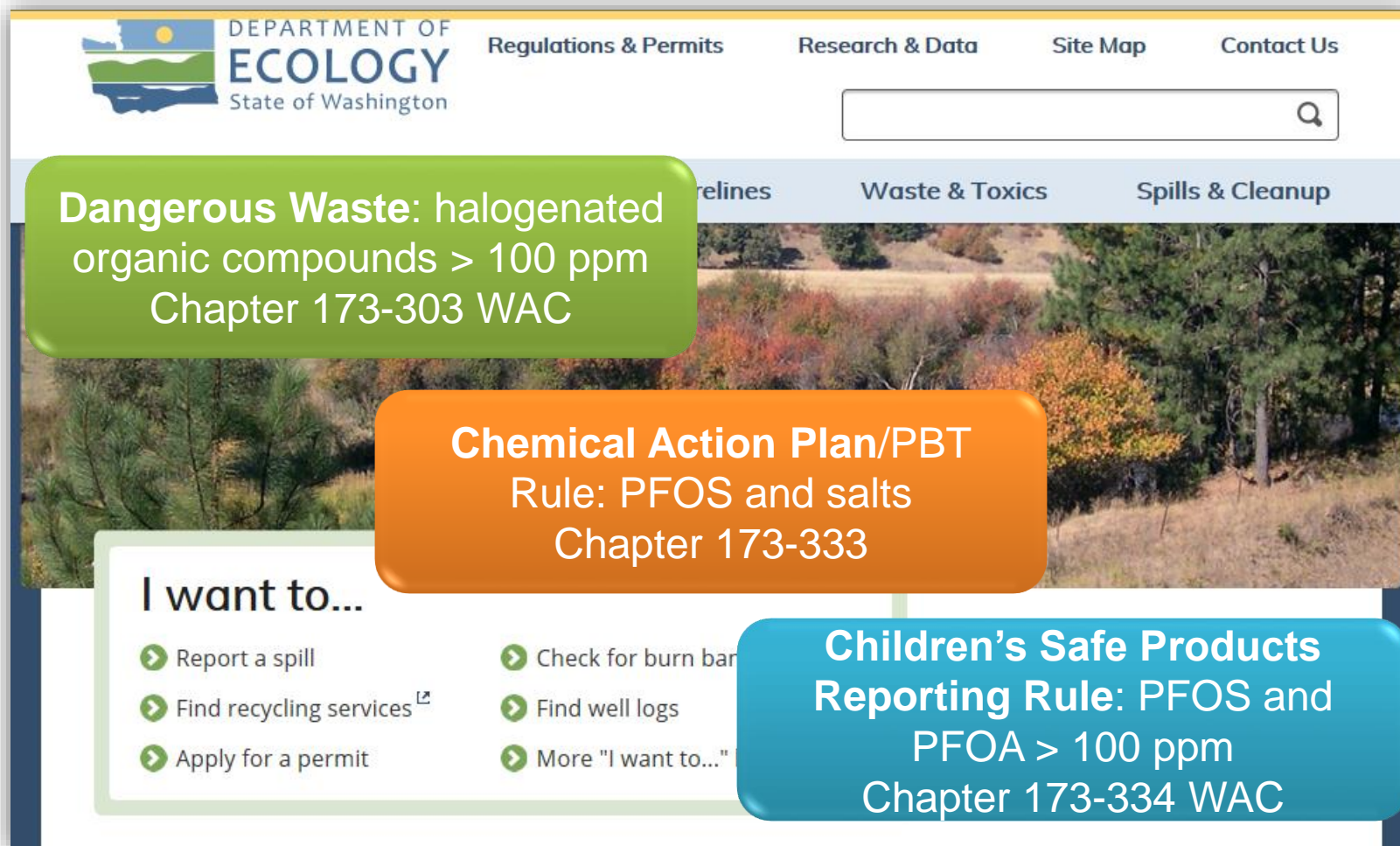
0 15 30 60 90 120 Miles

Map courtesy of WA Dept of Health





# PFAS and Ecology



The screenshot shows the Washington Department of Ecology website. The header includes the department logo, navigation links for Regulations & Permits, Research & Data, Site Map, and Contact Us, and a search bar. A secondary navigation bar lists Guidelines, Waste & Toxics, and Spills & Cleanup. The main content area features a background image of a forest with several informational callouts:

- Dangerous Waste:** halogenated organic compounds > 100 ppm  
Chapter 173-303 WAC
- Chemical Action Plan/PBT**  
Rule: PFOS and salts  
Chapter 173-333
- Children's Safe Products Reporting Rule:** PFOS and PFOA > 100 ppm  
Chapter 173-334 WAC

Below the callouts, a section titled "I want to..." lists several options with green arrow icons:

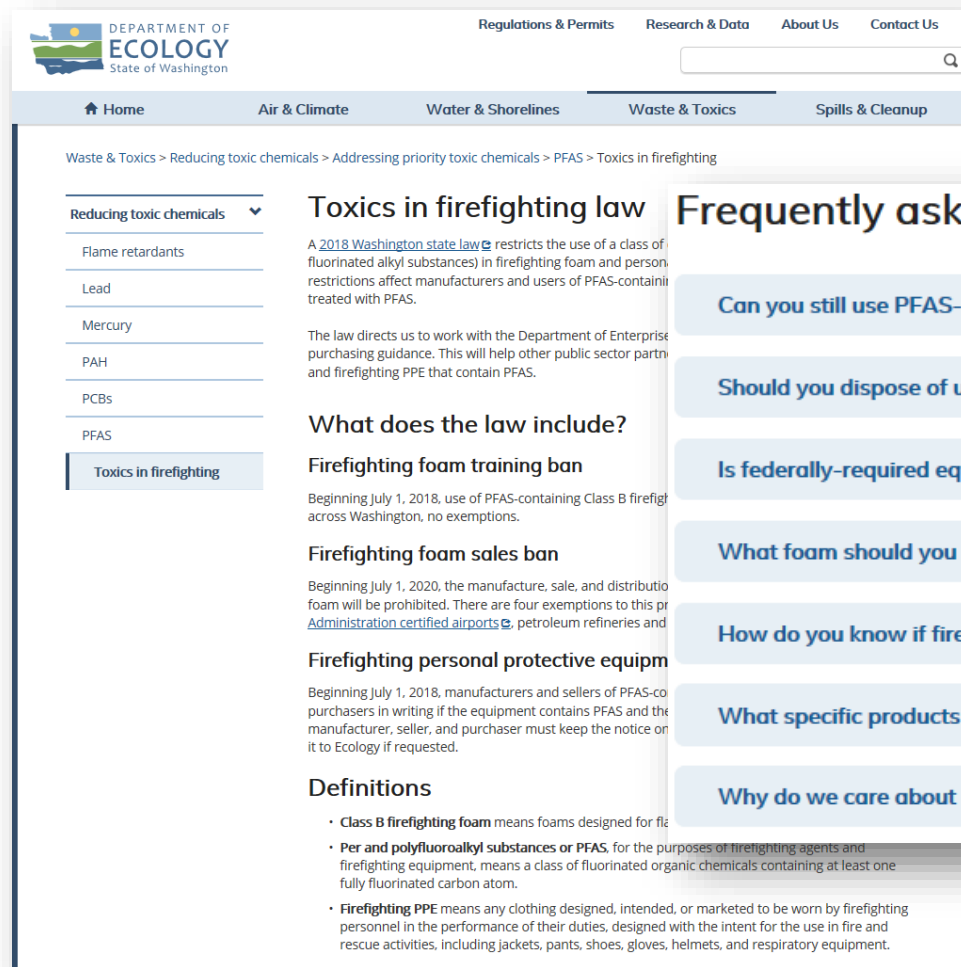
- Report a spill
- Find recycling services
- Apply for a permit
- Check for burn ban
- Find well logs
- More "I want to..."

<https://ecology.wa.gov/>





# PFAS firefighting foam



The screenshot shows the Washington Department of Ecology website. The header includes the department logo and navigation links: Regulations & Permits, Research & Data, About Us, and Contact Us. A search bar is also present. The main navigation bar has links for Home, Air & Climate, Water & Shorelines, Waste & Toxics (selected), and Spills & Cleanup. The breadcrumb trail reads: Waste & Toxics > Reducing toxic chemicals > Addressing priority toxic chemicals > PFAS > Toxics in firefighting. On the left, a sidebar menu lists categories: Reducing toxic chemicals (expanded), Flame retardants, Lead, Mercury, PAH, PCBs, PFAS, and Toxics in firefighting (selected). The main content area is titled 'Toxics in firefighting law' and contains the following sections:

- Toxics in firefighting law**

A 2018 Washington state law restricts the use of a class of fluorinated alkyl substances in firefighting foam and personal restrictions affect manufacturers and users of PFAS-containing treated with PFAS.

The law directs us to work with the Department of Enterprise purchasing guidance. This will help other public sector partner and firefighting PPE that contain PFAS.
- What does the law include?**
- Firefighting foam training ban**

Beginning July 1, 2018, use of PFAS-containing Class B firefighting foam across Washington, no exemptions.
- Firefighting foam sales ban**

Beginning July 1, 2020, the manufacture, sale, and distribution of PFAS-containing firefighting foam will be prohibited. There are four exemptions to this prohibition: [Administration certified airports](#), petroleum refineries and
- Firefighting personal protective equipment**

Beginning July 1, 2018, manufacturers and sellers of PFAS-containing firefighting equipment must provide written notice to the manufacturer, seller, and purchaser must keep the notice on file if the equipment contains PFAS and the manufacturer, seller, and purchaser must keep the notice on file if the equipment contains PFAS and the manufacturer, seller, and purchaser must keep the notice on file if the equipment contains PFAS.
- Definitions**
  - Class B firefighting foam** means foams designed for fire suppression.
  - Per and polyfluoroalkyl substances or PFAS**, for the purposes of firefighting agents and firefighting equipment, means a class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom.
  - Firefighting PPE** means any clothing designed, intended, or marketed to be worn by firefighting personnel in the performance of their duties, designed with the intent for the use in fire and rescue activities, including jackets, pants, shoes, gloves, helmets, and respiratory equipment.

## Chapter 70.75A RCW

<http://app.leg.wa.gov/RCW/default.aspx?cite=70.75A>

### Frequently asked questions

Can you still use PFAS-containing foam to fight fires? +

Should you dispose of unused PFAS-containing foam? +

Is federally-required equipment testing considered training? +

What foam should you use instead? +

How do you know if firefighting PPE contains PFAS? +

What specific products are considered PPE and require notification? +

Why do we care about PFAS? +

<https://ecology.wa.gov/Waste-Toxics/Reducing-toxic-chemicals/Addressing-priority-toxic-chemicals/PFAS/Toxics-in-firefighting>



# PFAS food packaging

Hazardous Waste and Toxics Reduction Program



## Focus on: Alternatives to PFAS in Food Packaging



### What are PFAS?

Per- and polyfluorinated substances (PFAS) are a class of synthetic chemicals used in hundreds of applications, including food packaging.

PFAS easily contaminate groundwater because they are water-soluble, highly mobile, and difficult to filter out.

### Who is exposed to PFAS?

Everyone.

In recent years, PFAS have been detected in Washington lakes, streams, fish, and drinking water wells.

### Why does food packaging contain PFAS?

PFAS helps keep grease, oil, and water from penetrating food packaging, such as paper and paperboard. Common examples include:

- Fast food sandwich wrappers.
- Restaurant take-out boxes.

### Washington State will ban PFAS in food packaging

In 2018, the Washington State legislature passed a new law that prohibits all per- and polyfluorinated substances (PFAS) in paper food packaging.

This PFAS ban is part of the [Toxics in Packaging Law \(RCW 70.95G\)](#).<sup>1</sup> In 1991, the Washington State legislature passed RCW 70.95G to limit the amount of four toxic metals (mercury, cadmium, lead, and hexavalent chromium) in packaging sold in the state.

In 2018, this law was amended to add PFAS.

### When will PFAS be banned in food packaging?

Safer alternatives to PFAS in food packaging must be available before the ban takes effect. The law requires Ecology to study PFAS in food packaging and assess the safety of alternatives. The ban will take effect January 2022, after we:

- Identify safer alternatives.
- Receive feedback from an external peer review.
- Publish the findings in the Washington State Register.

### How do I comment on and stay updated?

Ecology and Department of Health are working together to develop a [PFAS Chemical Action Plan \(CAP\)](#).<sup>2</sup> The goal of a CAP is to identify the potential health and environmental effects of persistent, bioaccumulative, and toxic chemicals, and recommend actions to reduce or eliminate those impacts.

We have a PFAS CAP listserv where you can receive updates. To subscribe, visit the [CAP Advisory Committee website](#).<sup>3</sup> We will host periodic conference calls to share updates on the PFAS AA. Those updates and any documents will be posted on the CAP website.

<sup>1</sup> <http://app.leg.wa.gov/RCW/default.aspx?Cite=70.95G>

<sup>2</sup> [ecology.wa.gov/PFAS](http://ecology.wa.gov/PFAS)

<sup>3</sup> <https://www.ezview.wa.gov/?alias=1962&pageid=37105>

## Chapter 70.95G RCW

<http://app.leg.wa.gov/RCW/default.aspx?cite=70.95G>

**January 2022 – PFAS food packaging ban. BUT first:** Ecology completes alternatives assessment.

## Interstate Chemicals Clearinghouse

Alternatives Assessment Guide  
Version 1.1



January 2017

<https://fortress.wa.gov/ecy/publications/documents/1804034.pdf>



# Substitute Senate Bill 5135

Repeating five-year cycle.  
Stakeholder process.  
Legislative reports.  
Transparent based on scientific evidence.  
Request manufacturer information.



# PFAS Resources and Information



The screenshot shows the Washington State Department of Ecology website. The navigation bar includes links for Regulations & Permits, Research & Data, About Us, and Contact Us. The main content area is titled "Waste & Toxics > Reducing toxic chemicals > Addressing priority toxic chemicals > PFAS". A sidebar on the left lists various topics, with "PFAS" selected under "Reducing toxic chemicals". The main text area is titled "Per- and poly-fluorinated alkyl substances (PFAS)" and contains a paragraph about the state's efforts to develop a chemical action plan. Below this, a box titled "I want to..." lists three links: "Learn more in the PFAS Chemical Action Plan Focus Sheet", "Read the Interim PFAS Chemical Action Plan", and "Track PFAS Chemical Action Plan advisory committee activities". At the bottom, a section titled "What are PFAS compounds?" explains that PFAS are a large group of perfluorinated and polyfluorinated alkyl substances that are stable and persistent in the environment. A final section titled "Sources and exposure" describes how PFAS compounds are used in various products and how they can enter the environment.

DEPARTMENT OF  
**ECOLOGY**  
State of Washington

Regulations & Permits Research & Data About Us Contact Us

Home Air & Climate Water & Shorelines Waste & Toxics Spills & Cleanup

Waste & Toxics > Reducing toxic chemicals > Addressing priority toxic chemicals > PFAS

**Reducing toxic chemicals** ▾

- Better Brakes Law
- Addressing priority toxic chemicals
- Flame retardants
- Lead
- Mercury
- PAH
- PCBs
- PFAS**
- Toxics in firefighting
- Green chemistry
- Children's Safe Products Act
- Washington's toxics in products laws
- Toxics studies

## Per- and poly-fluorinated alkyl substances (PFAS)

We are working with the Washington State Department of Health to develop a chemical action plan that identifies sources and recommends actions to reduce the use, release, and exposure to per- and poly-fluorinated alkyl substances (PFAS) in Washington. In developing these recommendations, we consult with an advisory committee composed of representatives from industry and environmental stakeholders.

**I want to...**

- ➔ Learn more in the PFAS Chemical Action Plan Focus Sheet
- ➔ Read the Interim PFAS Chemical Action Plan
- ➔ Track PFAS Chemical Action Plan advisory committee activities

## What are PFAS compounds?

PFAS are a large group of perfluorinated and polyfluorinated alkyl substances. These very stable, manufactured chemicals remain in the environment for a long time without breaking down, and some of them build up in people and the environment.

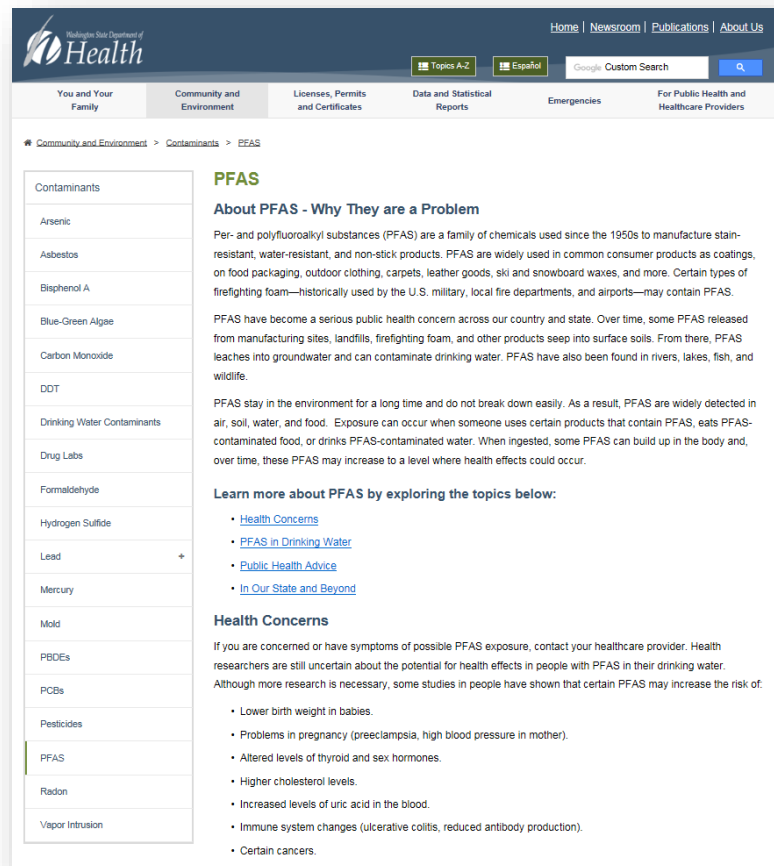
PFAS are water soluble and highly mobile, meaning they can easily contaminate groundwater and can be hard to filter out. Many PFAS transform into highly persistent perfluorinated chemicals in the environment. There are no natural processes that can break these substances down. Exposures could continue for hundreds or thousands of years.

## Sources and exposure

PFAS compounds are used to make coatings and products resistant to oil and water, or to reduce friction. They are added to cookware, carpets, food packaging, clothing, cosmetics, and other common consumer products. PFAS also have many industrial applications and are used to make certain types of firefighting foams.

In recent years, PFAS contamination above EPA's health advisory level has been found in drinking water wells in Airway Heights, North Whidbey Island, Issaquah, and at Joint Base Lewis-McChord. Even though PFAS compounds aren't manufactured in Washington, they are released into the environment through consumer and industrial products.

<https://ecology.wa.gov/PFAS>



The screenshot shows the Washington State Department of Health website. The navigation bar includes links for Home, Newsroom, Publications, and About Us. The main content area is titled "Community and Environment > Contaminants > PFAS". A sidebar on the left lists various contaminants, with "PFAS" selected. The main text area is titled "PFAS" and contains a section titled "About PFAS - Why They are a Problem" which explains that PFAS are a family of chemicals used since the 1950s to manufacture stain-resistant, water-resistant, and non-stick products. Below this, a section titled "Learn more about PFAS by exploring the topics below:" lists four links: "Health Concerns", "PFAS in Drinking Water", "Public Health Advice", and "In Our State and Beyond". At the bottom, a section titled "Health Concerns" explains that if you are concerned or have symptoms of possible PFAS exposure, you should contact your healthcare provider. It also lists several health concerns, including lower birth weight in babies, problems in pregnancy, altered levels of thyroid and sex hormones, higher cholesterol levels, increased levels of uric acid in the blood, immune system changes, and certain cancers.

Washington State Department of  
**Health**

Home | Newsroom | Publications | About Us

Topics A-Z Español Google Custom Search

You and Your Family Community and Environment Licenses, Permits and Certificates Data and Statistical Reports Emergencies For Public Health and Healthcare Providers

Community and Environment > Contaminants > PFAS

**PFAS**

## About PFAS - Why They are a Problem

Per- and polyfluoroalkyl substances (PFAS) are a family of chemicals used since the 1950s to manufacture stain-resistant, water-resistant, and non-stick products. PFAS are widely used in common consumer products as coatings, on food packaging, outdoor clothing, carpets, leather goods, ski and snowboard waxes, and more. Certain types of firefighting foam—historically used by the U.S. military, local fire departments, and airports—may contain PFAS.

PFAS have become a serious public health concern across our country and state. Over time, some PFAS released from manufacturing sites, landfills, firefighting foam, and other products seep into surface soils. From there, PFAS leaches into groundwater and can contaminate drinking water. PFAS have also been found in rivers, lakes, fish, and wildlife.

PFAS stay in the environment for a long time and do not break down easily. As a result, PFAS are widely detected in air, soil, water, and food. Exposure can occur when someone uses certain products that contain PFAS, eats PFAS-contaminated food, or drinks PFAS-contaminated water. When ingested, some PFAS can build up in the body and, over time, these PFAS may increase to a level where health effects could occur.

**Learn more about PFAS by exploring the topics below:**

- [Health Concerns](#)
- [PFAS in Drinking Water](#)
- [Public Health Advice](#)
- [In Our State and Beyond](#)

## Health Concerns

If you are concerned or have symptoms of possible PFAS exposure, contact your healthcare provider. Health researchers are still uncertain about the potential for health effects in people with PFAS in their drinking water. Although more research is necessary, some studies in people have shown that certain PFAS may increase the risk of:

- Lower birth weight in babies.
- Problems in pregnancy (preeclampsia, high blood pressure in mother).
- Altered levels of thyroid and sex hormones.
- Higher cholesterol levels.
- Increased levels of uric acid in the blood.
- Immune system changes (ulcerative colitis, reduced antibody production).
- Certain cancers.

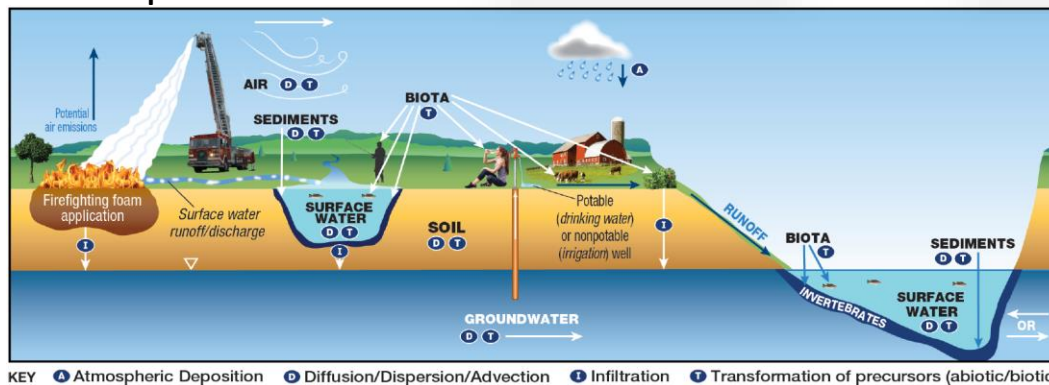
<https://www.doh.wa.gov/CommunityandEnvironment/Contaminants/PFAS>



# Chemical Action Plans



## Conceptual Site Model



## Chapter 173-333 WAC

<http://app.leg.wa.gov/WAC/default.aspx?cite=173-333>

Source: Adapted from L. Trozzolo, TRC, used with permission: <https://pfas-1.itrcweb.org/fact-sheets/>

ATSDR



Washington State  
Council of Fire Fighters



OUTDOOR  
INDUSTRY  
ASSOCIATION

# PFAS CAP Advisory Committee



*nəxʷqíyt nəxʷsʰkáyəm*  
PORT GAMBLE S'KLALLAM TRIBE

# CAP Information



## Interim Chemical Action Plan for Per- and Polyfluorinated Alkyl Substances

Revised January 2019  
Publication 18-04-005

### Hazardous Waste and Toxics Reduction Program



## Focus on: PFAS Chemical Action Plan



The U.S. Air Force distributes to residents after the water system (USAF photo)

**The Chemical Action Plan Process**  
Washington State's departments of Ecology and Health work together to develop chemical action plans. The goal of a chemical action plan is to comprehensively assess the environmental and health effects of a chemical or class of chemicals, and to recommend strategies to reduce or eliminate these impacts.

Ecology and Health work with industry, tribes, local governments, and environmental groups in developing the plans.

**Contact information**  
Kara Steward  
PFAS Chemical Action Plan lead  
360-407-6250  
[kara.steward@ecy.wa.gov](mailto:kara.steward@ecy.wa.gov)

For PFAS chemical action plan documents and updates, go to <http://prioritytoxics-pfas>

**Special accommodations**  
To request materials in a format for the visually impaired, visit [ecology.wa.gov/accessibility](http://ecology.wa.gov/accessibility), call Ecology at 360-407-6700, Relay Service 711, or TTY 877-833-6341.

**Protecting Washington from PFAS chemicals**  
The Washington State departments of Ecology and Health are working together to develop a chemical action plan that will identify and assess the environmental and health effects of PFAS chemicals, and to reduce or eliminate those impacts.

PFAS is an acronym for "per- and poly-fluorinated." PFAS are synthetic chemicals used in many consumer products, including food wrappers, fabrics, and carpets, to water, oil, grease, stains, and heat. Some forms of PFAS are water soluble and highly mobile, meaning they can transform into highly persistent perfluorinated compounds. There are no natural processes that break them down. Exposures could continue for years.

### Why we are concerned about PFAS

Everyone is exposed to PFAS, and some forms have been found in drinking water wells in Airway Heights, Issaquah, and at Joint Base Lewis-McChord. PFAS are water soluble and highly mobile, meaning they can transform into highly persistent perfluorinated compounds. There are no natural processes that break them down. Exposures could continue for years.

Ecology and Health released an Interim PFAS Chemical Action Plan in April 2018 that recommends ways to reduce per- and poly-fluorinated environmental releases. The plan includes provisions for new laws related to the use of PFAS-containing products, including food packaging.

Publication 18-04-002

April 2018

<https://fortress.wa.gov/ecy/publications/SummaryPages/1804005>

<https://fortress.wa.gov/ecy/publications/SummaryPages/1804002>



Department of Ecology  
Committees, Boards, and Workgroups

Sign In

Overview View our committees

Portal ID #1962

## PFAS Chemical Action Plan

### PFAS Chemical Action Plan Advisory Committee

The advisory committee helps the Departments of Ecology and Health develop a Chemical Action Plan (CAP) for Per- and Poly-Fluorinated Alkyl Substances (PFAS).

Subscribe to the [CAP listserv](#) to receive updates.

### PFAS CAP Webinar - on May 15, 2019

On May 15, Ecology and Health will host a webinar to review PFAS work by the agencies, answer questions about updated chapters and ask for comments on the preliminary CAP recommendations. We are asking interested parties to review the preliminary recommendations and provide feedback by June 3 (submit comments [online](#)). We will accept comments on the updated chapters, but be unable to provide responses to comments until after the public comment period (scheduled for this summer). Submit comments on an updated chapter or the preliminary recommendations [online](#). All interested parties are welcome to join the webinar and submit comments.

The webinar is scheduled for 9 am to noon. From 9 am to 11 am, we will review the CAP and discuss the preliminary recommendations. At 11 am the discussion will switch to the food packaging alternatives assessment. If the CAP discussion ends early, we will wait to start the food packaging discussion at 11 am.

Webinar	Online only, no in-person attendance.
Date	May 15, 2019
Registration	Go to this <a href="#">link</a> .
Topics	more detailed agenda coming soon.
-CAP review	9 am to 11 am - Pacific time.
-Food packaging	11 am to noon - Pacific time.
Presentation slides	coming soon.
Comments	<a href="#">Online</a> - comments on recommendations requested by June 3.

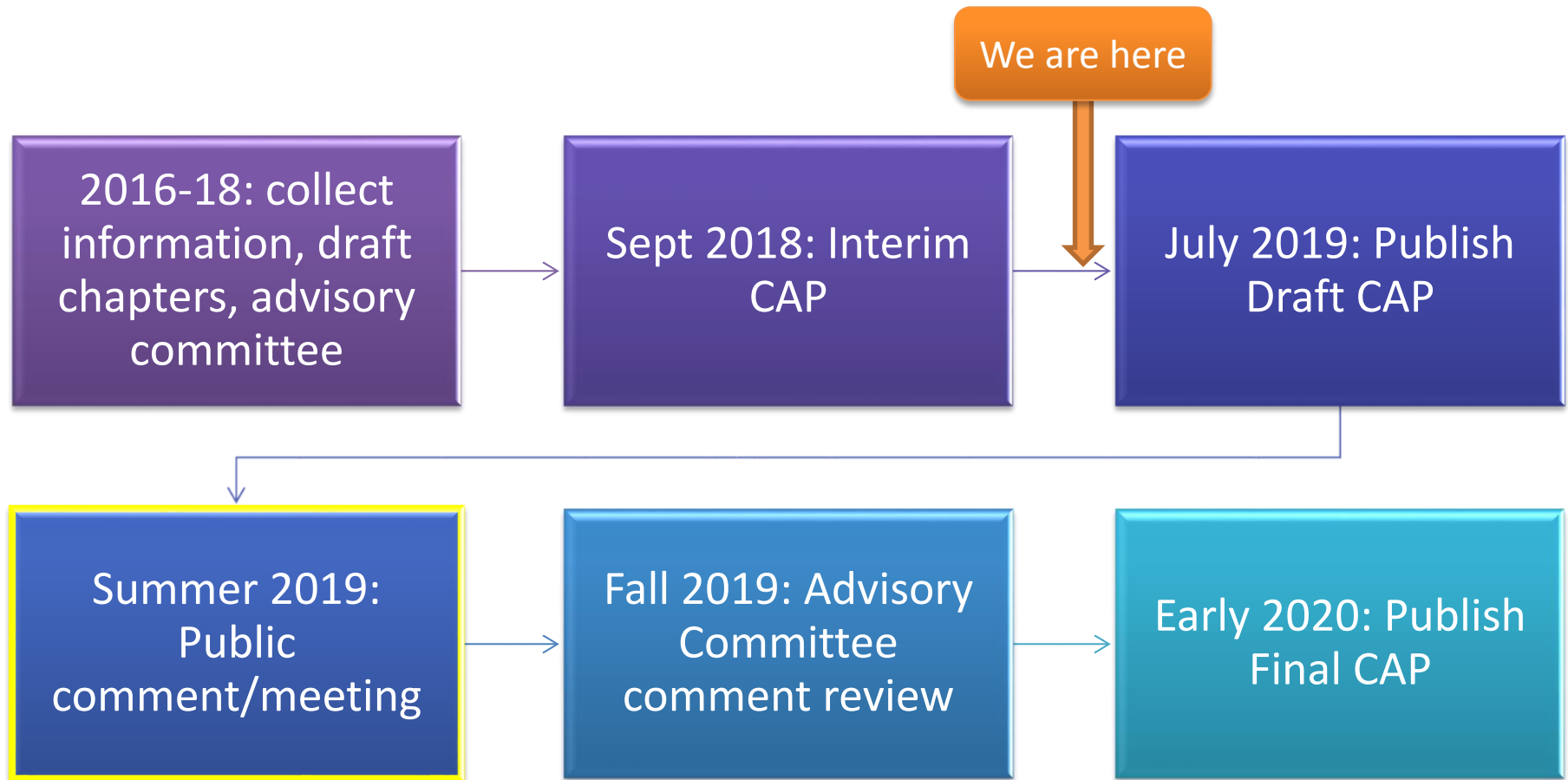
### Updated PFAS CAP Chapters

Ecology and Health have posted updated and new PFAS CAP chapters and the Preliminary CAP recommendations.

Updated chapter	Date posted	Updated chapter	Date posted
<a href="#">Biosolids</a>	January 22, 2019	<a href="#">Regulations</a>	February 28, 2019
<a href="#">Ecological Toxicology</a>	January 22, 2019	<a href="#">Sources and Uses</a>	February 28, 2019
<a href="#">Environment</a>	February 28, 2019	<a href="#">Chemistry</a>	April 22, 2019
<a href="#">Fate and Transport</a> (new)	February 28, 2019	<a href="#">Analytical Methods</a> (new)	April 22, 2019
<a href="#">Health</a>	February 28, 2019	<a href="#">Economic Analysis</a> (new)	May 1, 2019
		<a href="#">Preliminary Recommendations</a> (new)	May 1, 2019

<https://www.ezview.wa.gov/?alias=1962&pageid=37105>

# Where we are in the PFAS CAP process



WAC 173-333-430 - <http://apps.leg.wa.gov/wac/default.aspx?cite=173-333-430>  
PFAS CAP website: <https://www.ezview.wa.gov/?alias=1962&pageid=37105>



# Preliminary CAP recommendations



Safe drinking water



Environmental contamination



Reduce PFAS in products



Manage PFAS in waste



# Ecology contact information

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PFAS CAP Website:

<https://www.ezview.wa.gov/?alias=1962&pageid=37105>

CAP listserv:

<http://listserv.ecology.wa.gov/scripts/wa-ECOLOGY.exe?A0=CHEMICAL-ACTION-PLAN>

